REMARKS

By this amendment, claims 1, 14 and 15 have been amended in the application. Currently, claims 1, 6-15 and 20-27 are pending in the application.

Claims 1, 6-15 and 20-27 were rejected under 35 USC 103(a) as being obvious over Sakaguchi et al. (U.S. Patent No. 5,003,169) in view of Shteynberg et al. (U.S. Patent No. 6,635,862).

This rejection is respectfully traversed in view of the amendments to the claims and the remarks below.

The present invention relates to a multi-optical axis photoelectric sensor configured by light projecting and receiving units each of which is formed by disposing a plurality of optical elements in a line (see page 1, lines 5-8 in the specification).

The multi-optical axis photoelectric sensor 1 has an elongated case main body 2 made of aluminum and formed by an extrusion mold member. The case main body 2 has an almost U-shape in its section which is opened at both ends and its front surface (see Fig. 2). The case main body is small in its occupation area and slim as compared with the related-art

devices. The opened front surface of the case main body 2 constitutes a window 3 (see Fig. 2) for light projection and light reception which extends continuously in the longitudinal direction (see page 11, lines 4-13 in the specification).

Fig. 1 is a perspective view of the multi-optical axis photoelectric sensor. The multi-optical axis photoelectric sensor 1 has an elongated case main body 2. A front cover adhered to the front surface of the multi-optical axis photoelectric sensor 1 through adhesive is constituted by a first front cover 5 covering the front surface of the case main body 2 (see page 11, lines 4-13 and page 12, lines 3-6).

Fig. 18 shows that the receiving hole (first engagement portion) 214 of the main element holder 202 is located between at least two of the plurality of light guide housings 205 disposed on the main element holder 202. By this structure of the present invention, the main element holder and the additional element holder can maintain the rigidity of the connection better than prior art.

The number of the optical elements (the light projecting elements and the light receiving elements) contained within the multi-optical axis photoelectric sensor 1 shown in the figure and the distance (pitch) between the adjacent optical elements can be

set arbitrarily. In the example shown in the figures, the pitch is 20 mm, and the multi-optical axis photoelectric sensor may be provided with 8 optical axes, 12 optical axes, 16 optical axes, 20 optical axes or the like, that is, up to 64 optical axes with the 64 optical elements at the maximum for example, on an arbitrary number of the optical elements unit basis by providing the case main bodies 2 with different sizes (see page 14, line 19 - page 15, line 6).

One of the objects in the present invention is to provide a multi-optical axis photoelectric sensor which can easily keep a pitch constant between respective adjacent optical elements contained within the multi-optical axis photoelectric sensor (see page 4, lines 1-5 in the specification).

According to the present invention, a main element holder and an additional element holder are mechanically coupled to each other while securing the relative positioning between the main element holder and the additional element holder by engagement portions. Therefore, the pitch between the optical element at the end portion of the main element holder and the adjacent optical element at the end portion of the additional element holder is constant (see page 5, lines 2-10 in the specification).

By this amendment, independent claims 1 and 14 have been amended to recite "an elongate casing including an opening along a longitudinal direction; a front cover covering the opening of said elongate casing; a main element holder disposed within said elongate casing including a plurality of light guide housings disposed along a longitudinal axis of said main element holder, each having an optical element therein, said main element holder having a first engagement portion; an additional element holder disposed within said elongate casing including a plurality of light guide housings disposed along a longitudinal axis of said additional element holder, each having an optical element therein, said additional element holder having a second engagement portion capable of mechanically engaging and disengaging said first engagement portion of said main element holder".

Similarly, independent claim 15 has been amended to recite "a first elongate casing including an opening along a longitudinal direction; a front cover covering the opening of said first elongate casing; a first main element holder disposed within said first elongate casing including a plurality of light guide housings disposed along a longitudinal axis of said first main element holder, each having an optical projecting element

therein, said first main element holder having a first engagement portion; a first additional element holder disposed within said first elongate casing including a plurality of light guide housings disposed along a longitudinal axis of said first additional element holder, each having an optical projecting element therein, said first additional element holder having a second engagement portion capable of mechanically engaging and disengaging said first engagement portion of said first main element holder". Also, independent claim 15 has been amended to recite "a second elongate casing including an opening along a longitudinal direction; a second front cover covering the opening of said second elongate casing; a second main element holder disposed within said second elongate casing including a plurality of light guide housings disposed along a longitudinal axis of said second main element holder, each having an optical receiving element therein, said second main element holder having a third engagement portion; a second additional element holder disposed within said second elongate casing including a plurality of light guide housings disposed along a longitudinal axis of said second additional element holder, each having an optical receiving element therein, said second additional element holder having a fourth engagement portion capable of mechanically engaging and

disengaging said third engagement portion of said second main element holder".

These features are not shown or suggested by Sakaguchi et al., Shteynberg et al. or any combination of these references.

Sakaguchi et al. relate to a photoelectric switch in which a light-emitting section composed of a plurality of light-emitting elements is confronted with a light-detecting section composed of a plurality of light-detecting elements, thus forming a multi-optical-path (see column 1, lines 6-10).

Sakaguchi et al. disclose that in Fig. 1, the light-detecting section 10 includes a base unit 11, at least one relay unit 12 which can be connected to the top of the base unit 11, and an end unit 13 which can be connected to the top of the base unit 11 or the relay unit 12 (see column 4, lines 7-11).

Sakaguchi et al. also disclose that Fig. 33 shows a structure of the connecting parts of the units. Substantially T-shaped protrusions 125 and 126 are formed on the end face of a first unit, and a male connector 128 with male terminals 127 is secured to the top of the protrusion 125. Engaging grooves 129 are formed in the front and rear surfaces of the first unit 125. On the other hand, a second unit has a groove 131 in its end portion which is substantially similar in configuration to the

protrusions 125 and 126 of the first unit. A female connector 133 having female terminals 132 as shown in Fig. 34 is provided at the bottom of the groove 131. An engaging groove 134 is formed in the front surface of the second unit 130 in such a manner that it converges inwardly (see column 10, line 58 - column 11, line 3).

The Examiner admitted that Sakaguchi et al. do not disclose the first engagement portion of the main element holder is located between at least two of the plurality of light guide housings disposed on said main element holder.

Also, Sakaguchi et al. do not disclose that an elongate casing including an opening along a longitudinal direction; a front cover covering the opening of the elongate casing; a main element holder disposed within the elongate casing including a plurality of light guide housings disposed along a longitudinal axis of the main element holder, each having an optical element therein, the main element holder having a first engagement portion; an additional element holder disposed within the elongate casing including a plurality of light guide housings disposed along a longitudinal axis of the additional element holder, each having an optical element therein, the additional element holder having a second engagement portion capable of

mechanically engaging and disengaging the first engagement portion of the main element holder, as claimed in claims 1 and 14.

Sakaguchi et al. also do not disclose that the first engagement portion of the main element holder is located between at least two of the plurality of light guide housings disposed on the main element holder as claimed in claims 1 and 14.

Sakaguchi et al. also do not disclose that a first elongate casing including an opening along a longitudinal direction; a front cover covering the opening of the first elongate casing; a first main element holder disposed within the first elongate casing including a plurality of light guide housings disposed along a longitudinal axis of the first main element holder, each having an optical projecting element therein, the first main element holder having a first engagement portion; a first additional element holder disposed within the first elongate casing including a plurality of light guide housings disposed along a longitudinal axis of the first additional element holder, each having an optical projecting element therein, the first additional element holder having a second engagement portion capable of mechanically engaging and disengaging the first

engagement portion of the first main element holder as claimed in claim 15.

Sakaguchi et al. also do not disclose that the first engagement portion of the first main element holder is located between at least two the plurality of light guide housings disposed along the longitudinal axis of the first main element holder as claimed in claim 15.

Sakaguchi et al. also do not disclose that a second elongate casing including an opening along a longitudinal direction; a second front cover covering the opening of the second elongate casing; a second main element holder disposed within the second elongate casing including a plurality of light guide housings disposed along a longitudinal axis of the second main element holder, each having an optical receiving element therein, the second main element holder having a third engagement portion; a second additional element holder disposed within the second elongate casing including a plurality of light guide housings disposed along a longitudinal axis of the second additional element holder, each having an optical receiving element therein, the second additional element holder having a fourth engagement portion capable of mechanically engaging and disengaging the

third engagement portion of the second main element holder as claimed in claim 15.

Sakaguchi et al. also do not disclose that the third engagement portion of the second main element holder is located between at least two of the plurality of light guide houses disposed on the second main element holder as claimed in claim 15.

For these reasons, it is believed that Sakaguchi et al. do not show or suggest the present claimed features of the present invention. Applicant also submits that Shteynberg et al. do not make up for the deficiencies in Sakaguchi et al.

Shteynberg et al. relate to light curtains, and particularly relates to light curtain systems comprising multiple segments (see column 1, lines 18-20).

Shteynberg et al. disclose that Fig. 6 shows a rigid connector 40. In this embodiment, the segments 22 (or 24) have rounded distal ends, with offsets at these ends that form shelves on which mating connector halves 140 and 150 are attached. Mating connector halves or sections 140 and 150 comprise an exemplary type of rigid connector 40, and allow two rigidly interconnected segments 22 or 24 to be rotatably interconnected (see column 6, lines 41-52).

Shteynberg et al. do not disclose that an elongate casing including an opening along a longitudinal direction; a front cover covering the opening of the elongate casing; a main element holder disposed within the elongate casing including a plurality of light guide housings disposed along a longitudinal axis of the main element holder, each having an optical element therein, the main element holder having a first engagement portion; an additional element holder disposed within the elongate casing including a plurality of light guide housings disposed along a longitudinal axis of the additional element holder, each having an optical element therein, the additional element holder having a second engagement portion capable of mechanically engaging and disengaging the first engagement portion of the main element holder, as claimed in claims 1 and 14.

Shteynberg et al. also do not disclose that the first engagement portion of the main element holder is located between at least two of the plurality of light guide housings disposed on the main element holder as claimed in claims 1 and 14.

Shteynberg et al. also do not disclose that a first elongate casing including an opening along a longitudinal direction; a front cover covering the opening of the first elongate casing; a first main element holder disposed within the first elongate

casing including a plurality of light guide housings disposed along a longitudinal axis of the first main element holder, each having an optical projecting element therein, the first main element holder having a first engagement portion; a first additional element holder disposed within the first elongate casing including a plurality of light guide housings disposed along a longitudinal axis of the first additional element holder, each having an optical projecting element therein, the first additional element holder having a second engagement portion capable of mechanically engaging and disengaging the first engagement portion of the first main element holder as claimed in claim 15.

Shteynberg et al. also do not disclose that the first engagement portion of the first main element holder is located between at least two the plurality of light guide housings disposed along the longitudinal axis of the first main element holder as claimed in claim 15.

Shteynberg et al. also do not disclose that a second elongate casing including an opening along a longitudinal direction; a second front cover covering the opening of the second elongate casing; a second main element holder disposed within the second elongate casing including a plurality of light

guide housings disposed along a longitudinal axis of the second main element holder, each having an optical receiving element therein, the second main element holder having a third engagement portion; a second additional element holder disposed within the second elongate casing including a plurality of light guide housings disposed along a longitudinal axis of the second additional element holder, each having an optical receiving element therein, the second additional element holder having a fourth engagement portion capable of mechanically engaging and disengaging the third engagement portion of the second main element holder as claimed in claim 15.

Shteynberg et al. also do not disclose that the third engagement portion of the second main element holder is located between at least two of the plurality of light guide houses disposed on the second main element holder as claimed in claim 15.

It is therefore respectfully submitted that Sakaguchi et al. and Shteynberg et al., individually or in combination, do not teach, disclose or suggest the presently claimed invention and it would not have been obvious to one of ordinary skill in the art to combine these references to render the present claims obvious.

In view of foregoing claim amendments and remarks, it is respectfully submitted that the application is now in condition for allowance and an action to this effect is respectfully requested.

If there are any questions or concerns regarding the amendments or these remarks, the Examiner is requested to telephone the undersigned at the telephone number listed below.

Respectfully submitted,

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